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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,498	07/25/2003	Gregory A. Steinlage	15-X-6176 (GEMS-A 0130)	1497
27256	7590	08/24/2004	EXAMINER	
ARTZ & ARTZ, P.C. 28333 TELEGRAPH RD. SUITE 250 SOUTHFIELD, MI 48034			ARTMAN, THOMAS R	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/604,498	<b>Applicant(s)</b> STEINLAGE ET AL.	
	<b>Examiner</b> Thomas R Artman	<b>Art Unit</b> 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

Claim 11 is objected to because of the following: the limitation stating that “an exterior oxidized surface...is oxidized” is redundant and causes confusion. Perhaps the “exterior oxidized surface” should read “exterior surface.” It shall be examined upon these merits.

Appropriate correction is required.

Claim 12 is objected to because of the following: the limitation stating that “an exterior oxidized surface...is non-oxidized” is contradictory and causes confusion. Perhaps the “exterior oxidized surface” should read “exterior surface.” It shall be examined upon these merits.

Appropriate correction is required.

Claims 14 and 15 are objected to because of the following: antecedent basis is lacking for “said non-magnetic, non-corrosive iron-based material.” Parent claim 10 does not mention that the “non-magnetic, non-corrosive material” is “iron-based.” In order to expedite prosecution, the examiner will assume that the material must be iron-based for claims 14 and 15.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Klostermann (US 5,185,774) (referred to herein as “K774”).

Regarding claims 1, 2, 17 and 18, K774 discloses an imaging x-ray tube rotor assembly (Figs.2 and 16), including, at least partially, a magnetic non-corrosive material (magnetic stainless steel parts 177, 182 and 184).

Further regarding claims 2, 17 and 18, the rotor core is produced, at least partially, from a magnetic non-corrosive material.

Further regarding claim 18, the material is iron-based.

With respect to claims 3 and 19, the rotor core approximately comprises at least 12% chromium (magnetic stainless steel No. 416).

With respect to claim 4, the rotor core at least partially comprises stainless steel (magnetic stainless steel No. 416).

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Claims 1, 2, 5, 17, 18 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by DeCou (US 6,144,720).

Regarding claims 1, 2, 17 and 18, DeCou discloses an imaging x-ray tube rotor assembly (FIGURE), including, at least partially, a magnetic non-corrosive material (iron oxide layer 58, reduced amount of particles generated, col.2, lines 45-48).

Further regarding claims 2, 17 and 18, the rotor core is produced, at least partially, from a magnetic non-corrosive material.

Further regarding claim 18, the material is iron-based.

With respect to claims 5 and 25, the exterior surface of the rotor is oxidized (col.3, lines 49-50).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-9, 16-19, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klostermann (US 5,056,126) (referred to herein as "K126") in view of K774.

Regarding claims 1 and 16-18, K126 discloses an imaging x-ray tube rotor assembly (Figs.4, 5 and 14) including a magnetic material (steel in squirrel cage rotor core 72).

K126 does not disclose that the magnetic material is non-corrosive. However, the squirrel cage rotor is connected to a stainless steel support sleeve 71, showing that non-corrosive materials are important in the environment of the x-ray tube for longevity and stable performance.

K774 teaches the practice of using magnetic stainless steels in rotor drive mechanisms (items 177, 182 and 184) that are used in x-ray tubes where corrosion resistance is important for improved longevity. In this way, rotor structures can be corrosion resistant without the need for additional materials, coatings, or other methods of protection.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for K126 to substitute magnetic stainless steel for the steel in the squirrel cage rotor such that the rotor is corrosion resistant for improved longevity as suggested by K774.

Further regarding claims 16-18 and with respect to claims 2-4 and 19, the prior art combination above provides a rotor core produced at least partially from a magnetic non-corrosive material (squirrel cage rotor core 72 of K126 made from magnetic stainless steel No. 416 as taught by K774). Furthermore, steel No. 416 is an iron-based stainless steel with at least 12% chromium.

Further regarding claim 16 and with respect to claims 6, 8, 23 and 24, the squirrel cage rotor 72 of K126 has a plurality of slots integrally formed in the rotor core, and a plurality of bars produced at least partially from a non-magnetic highly-conductive material that are coupled to the slots.

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With respect to claims 7 and 9, the non-magnetic highly-conductive material is copper.

Claims 1, 2, 10, 12-15, 18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siemens (US 5,553,114) in view of K774.

Regarding claims 1, 2 and 18, Siemens discloses an imaging x-ray tube rotor assembly (Fig.4) that has a rotor core (Fig.5) made from at least partially an iron-based magnetic material 90 (steel No. 1018).

Siemens does not specifically disclose that the rotor core material is non-corrosive.

K774 teaches the practice of using magnetic stainless steels in rotor drive mechanisms (items 177, 182 and 184 made of magnetic stainless steel No. 416) that are exposed to the vacuum environment of the x-ray tube. As is known in the art, corrosion resistance is important for improved reliability and longevity of the x-ray tube.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute magnetic stainless steel for the steel of Siemens such that the rotor is corrosion resistant for improved longevity of the x-ray tube as suggested by K774.

With respect to claims 10, 20 and 21, Siemens further discloses:

a) a sheet 92 coupled to the rotor core made at least in part from a non-magnetic, highly conductive material, and

b) a sleeve 96 coupled to the sheet and produced at least partially from a non-magnetic, non-corrosive material (stainless steel No. 316, see at least Tables 2 and 3, as well as col.8, lines 57-67).



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With respect to claim 12, the exterior surface of the sleeve of Siemers is not oxidized.

With respect to claim 13, the non-magnetic, highly conductive material is copper.

With respect to claims 14 and 15, the non-corrosive, non-magnetic material is a stainless steel (No. 316) having at least 12% chromium.

Claims 5, 11, 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siemers and K774, as applied to claims 2, 10, 18 and 21 above, in view of Warren (US 6,390,875).

With respect to all four claims, neither Siemers nor K774 specifically disclose the practice of oxidizing the exterior sleeve surface. Siemers does mention that small, naturally-occurring amounts of oxidation on the surface may favorably affect the thermal emissivity of the stainless steel sleeve. The oxidation includes the formation of chromium oxides, which give stainless steels their non-corrosive properties as well as providing high thermal emissivities.

Warren specifically teaches the practice of purposely oxidizing stainless steel surfaces in x-ray tubes for improved thermal emissivity and corrosion resistance. In this manner, the x-ray source will have greater longevity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the exterior surface of the sleeve of Siemers to be oxidized as taught by Warren such that greater longevity of the x-ray source is achieved through the improved thermal emissivity and corrosion resistant properties.



### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hansen (US 5,773,909), Ono (US 5,506,881) and Ono (US 5,696,804) teach cylindrical rotor cores with iron or iron-based alloys and copper sheets coupled to the cores.

Warburton (US 6,330,304) teaches the use of non-iron based alloys for improved corrosion resistance of rotor cores.

Kliman (US 6,274,962) teaches a cylindrical rotor core made of a ferromagnetic aggregate/polymer matrix composite with a sheet made copper, aluminum or brass, and further teaches the specific needs and concerns regarding rotor construction in x-ray tube environments.

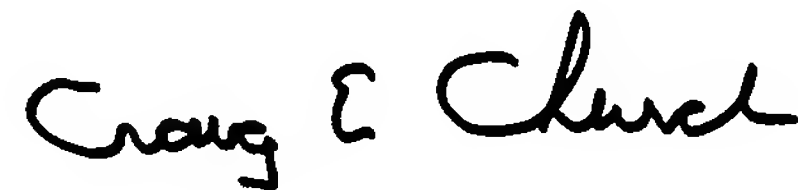
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 6:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman  
Patent Examiner



Craig E. Church  
Primary Examiner